Space Weather Forecast

Issued on Wednesday, 25 October 2023 at 12:56 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: No significant activity.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with four common class flares, the largest was from a region of 'plage' rotating over the northeast limb. These regions areas of increased magnetic field often due to decayed spots (although occasionally regions where spots form), and appear white on visible imagery of the solar disc. Of the two small and simple sunspots on the disc, the southernmost one, just west of the south centre disc is the most developmental, with the emergence of small intermediate spots. While the other regions, closer to the southwest limb, persists as a small mature unipolar spot.

No Earth-directed CMEs (coronal mass ejections) have been observed. However, an eruption occurred from a filament near the centre disc around 25/0750 UTC. These are lines of material held together by the Suns magnetic field and when they erupt, they can release material as a CME. However it is currently too early to assess the likelihood that a CME was produced, with further imagery required.

Solar Wind / Geomagnetic Activity: The solar wind persisted at background conditions with speeds declining from near 400 km/s to around 320km/s. Interplanetary Magnetic Field (IMF) was weak with its north-south component, predominately positive (northward) but also weak. Geomagnetic activity was Quiet (Kp 0-1).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity forecast with occasional common class flares. There is a slight chance of Moderate flares, with the main risk currently from the small sunspot just west of the southern centre disc.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Background winds are expected to become briefly enhanced by the arrival of the fast winds from a weak coronal hole, most likely on day 3 (27 Oct). Any enhancement is expected to be minimal with winds likely peaking around 450 km/s, before easing day 4 (28 Oct). Geomagnetic activity is forecast to be mainly Quiet, rising to Unsettled with Active spells likely with any fast wind onset day 3 (27 Oct).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	15	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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